

**SYNTHESIS AND CHARACTERIZATION OF PALM OIL BASED
POLYOL WATERBORNE POLYURETHANE**

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ABSTRACT

SYNTHESIS AND CHARACTERIZATION PALM OIL BASED POLYOL WATERBORNE POLYURETHANE

Palm oil based polyol was successfully synthesized in this study by the epoxidation and hydroxylation process. The waterborne polyurethane was formed from the reaction of polyol, isocyanate and dimethylol propionic acid with the ratio 1:0.3:0.04. The arising problem from non-environmental friendly and non-biodegradability of petroleum based waterborne polyurethane can be overcome by replacing it with the vegetable oil based waterborne polyurethane such as palm oil based polyol waterborne polyurethane. Palm oil based polyol and palm oil based polyol waterborne polyurethane were analyzed by Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscope (SEM). FTIR analysis showed the functional group of C=C in palm oil at 3006 cm^{-1} was broken to form O-H functional group (3454 cm^{-1}) that known as palm oil based polyol and for the final stages, O-H functional group in polyol was shifted by N-H functional group (3334 cm^{-1}) to indicate that waterborne polyurethane was successfully synthesized. Meanwhile, SEM analysis represented that palm oil based polyol waterborne polyurethane film has fibrous structure with flat and smooth surface that suitable for coating application.